

# SEQUENCE LISTING

<110> McBride, Jere W.  
Walker, David H.

<120> P153 and P156 Antigens for the Immunodiagnosis of  
Canine and Human Ehrlichioses and Uses Thereof

<130> D6481

<141> 2003-11-04

<150> US 60/423,573  
<151> 2002-11-04

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<212> PRT  
<213> *Ehrlichia canis*

<220>  
<223> immunoreactive surface protein p153

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Thr	Gln	Val	Leu	Glu	Glu	Asp	Pro	Ser	Val	Glu	Glu	Glu	Glu	Glu	35	40	45
Ile	Ala	Pro	Pro	Leu	Pro	Pro	Arg	Asn	Asn	Val	Gly	Glu	Val	Glu	50	55	60
Pro	Gln	Glu	Asp	Pro	Ile	Tyr	Gln	Gly	Ile	Pro	Gly	His	Gln	Glu	65	70	75
Glu	Met	Glu	Glu	Asp	Pro	Tyr	Ala	Ser	Leu	Asp	Gln	Val	Ser	Gln	80	85	90
Gly	Ala	Gly	Ala	Asp	Gly	Ile	Gln	Glu	Asn	Pro	Val	Pro	Gln	Glu	95	100	105
Ala	Gly	Glu	Glu	Leu	Glu	Glu	Asp	Ile	Tyr	Gln	Asp	Pro	Ala	Asp	110	115	120
Phe	Gln	Gly	Leu	Gly	Gln	Gly	Gly	Gln	Gln	Leu	Asp	Gln	Ala	Gly	125	130	135
Tyr	Gln	Gly	Pro	Ser	Ile	Gly	Asp	Arg	Gln	Leu	Val	Asn	Gly	Pro	140	145	150
Tyr	Gly	Phe	Asn	Asp	Gly	Ser	Tyr	Ala	Met	Glu	Phe	Asp	Asp	Val	155	160	165
Met	Trp	Glu	Gly	Val	Arg	Asp	Ala	Val	Ile	His	Asp	Glu	Glu	Ile	170	175	180
Asp	Pro	Lys	Phe	Leu	Val	Thr	Asp	Gly	Leu	Met	Arg	His	Ile	Cys	185	190	195

Asp	Lys	Ile	Val	Gln	Ser	Glu	Gly	Asn	Leu	Pro	Glu	Pro	Asp	Leu	200	205	210
Glu	Glu	Ile	Val	Ser	Ile	Leu	Lys	Asn	Asp	Lys	Glu	Gly	Ile	Ser	215	220	225
Glu	Leu	Ile	Asn	Glu	Pro	Val	Gln	Val	Asp	Ile	Pro	Asn	Asn	Pro	230	235	240
Val	Arg	Glu	Gly	Arg	Asn	Val	Met	Thr	Leu	Leu	His	Leu	Ala	Tyr	245	250	255
Ala	Tyr	Asn	Val	Asp	Pro	Arg	Ile	Ile	Asn	Ala	Ile	Glu	Ser	Val	260	265	270
Glu	Asn	Ser	Phe	Gly	Glu	Ser	Gly	Leu	Asp	Gly	Tyr	Asn	Ile	Gln	275	280	285
Asp	Ala	Asp	Gly	Asn	Leu	Pro	Leu	His	His	Ala	Ala	Lys	Asn	Cys	290	295	300
Asn	Gly	Gln	Val	Leu	Asp	Asn	Cys	Ile	Ser	Lys	Thr	Asn	Ser	Asn	305	310	315
Ile	Ile	Asn	Ile	Arg	Asn	Phe	Gly	Asn	Gln	Ser	Pro	Leu	His	Val	320	325	330
Met	Val	Gln	Asn	Pro	Gly	Cys	Ser	Ile	Gly	Asn	Ile	Gln	Val	Ala	335	340	345
Asn	Glu	Cys	Gly	Met	Asp	Phe	Asn	Leu	Ile	Asp	His	Pro	Thr	Gly	350	355	360
Arg	Met	Pro	Ile	His	Tyr	Ala	Ala	Glu	Ala	Ala	Ser	Ser	Glu	Val	365	370	375
Leu	Ser	Tyr	Val	Ile	Arg	Asn	Thr	Lys	Ala	Glu	Ser	Pro	Gln	Ala	380	385	390
Ser	Ala	Val	Asn	Thr	Gln	Asp	Val	Asn	Gly	Arg	Thr	Pro	Leu	His	395	400	405
Cys	Ala	Ala	Ile	Ser	Gly	Asn	Ser	Lys	Gly	Leu	Ser	Val	Met	Leu	410	415	420
Leu	Gln	Asn	Gly	Val	Asp	Cys	Ala	Val	Arg	Asp	Lys	Asn	Tyr	Ser	425	430	435
Thr	Pro	Leu	His	Tyr	Ala	Val	Ala	Gly	Asn	Asp	Ile	Lys	Ser	Ile	440	445	450
Lys	Asn	Leu	Cys	Ser	Val	Lys	Gly	Arg	Val	Gln	Gly	Val	Lys	Ser	455	460	465
Ser	Ala	Ala	Ser	Leu	Leu	Cys	Glu	Asp	Leu	Gln	Gly	Asp	Thr	Pro	470	475	480
Leu	His	Ile	Ala	Cys	Lys	Val	Glu	Gly	Thr	Lys	Ala	Phe	Glu	Thr	485	490	495
Val	Arg	Gln	Ser	Ile	Lys	Lys	His	His	Gly	Lys	Gln	Val	Leu	Gln	500	505	510
Glu	Leu	Leu	Ile	Arg	Glu	Gly	Ser	Gly	Pro	Arg	Leu	Asn	Val	Ser	515	520	525
Gly	Phe	Gly	Ser	Gln	Ser	Ile	Leu	Ser	Gly	Val	Ser	Gly	Asp	Leu	530	535	540
Tyr	Gly	Tyr	Leu	Asn	Ser	Gln	Asn	Phe	Pro	Thr	Ser	Pro	Val	His	545	550	555
Ala	Ala	Val	Lys	Ala	Asn	Asn	Leu	Gln	Leu	Leu	Asn	Leu	Phe	Leu	560	565	570
Lys	Lys	Ser	Pro	Asp	Ile	Leu	Arg	Gln	Ser	Ser	Pro	Asn	Gly	Phe	575	580	585

Asn	Pro	Val	His	Met	Ala	Ala	Leu	Phe	Ala	Asp	Val	Lys	Thr	Val
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Lys	Leu	Ile	Ile	Glu	Asn	Ala	Ser	Gly	Glu	Glu	Val	Asn	Ala	Gln
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Ser	Asp	Ser	Thr	Leu	Thr	Pro	Leu	His	Leu	Ala	Cys	Ile	Arg	Gly
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Asp	Gly	Ser	Ile	Ile	Lys	Arg	Met	Val	Glu	His	Glu	Ser	Val	Asn
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Val	Asn	Gln	Thr	Met	Gly	Pro	Asp	Gln	Asn	Thr	Val	Leu	Gln	Tyr
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Ala	Ile	Asn	Arg	Gly	Asn	His	Ser	Leu	Ile	Lys	Arg	Leu	Leu	Ser
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His	Pro	Ser	Ile	Asp	Leu	Asn	Val	Arg	Asn	Ala	Asp	Gly	Lys	Thr
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Ser	Ala	His	Ser	Ala	Met	Glu	Lys	Gly	Asp	Leu	Lys	Thr	Val	Lys
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Ala	Leu	Cys	Asn	Ala	Gly	Ala	Asp	Val	Asn	Thr	Val	Asp	Asn	Asn
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Gly	Arg	Ser	Val	Ile	Ser	Ser	Ala	Ile	Tyr	Ser	Gly	Gln	Asn	Glu
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Lys	Lys	Leu	Val	Pro	Ile	Val	Lys	Leu	Leu	Leu	Asn	Ser	Gly	Ala
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Lys	Ile	Gly	Ser	Gln	Glu	Asp	Lys	Asn	Ile	Leu	Leu	Gln	Lys	Cys
				755					760					765
Ile	Asn	Ser	Gly	Tyr	Asn	Lys	Leu	Leu	Asp	Leu	Leu	Leu	Glu	Gln
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Gly	Glu	Arg	Ile	Asn	Val	Glu	Gly	Lys	Ala	Ser	Pro	Leu	Val	Ser
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Ala	Val	Val	Ser	Gly	Asn	Thr	His	Ala	Val	Lys	Lys	Leu	Val	Ala
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Ser	Gly	Gly	Asp	Ile	Asn	Gln	Lys	Val	Ser	Asp	Glu	Asn	Ser	Ile
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His	Tyr	Lys	Asn	Ser	Leu									
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                   20                  25                  30  
 Pro Ile Glu Arg Glu Arg Val Ala Ala Pro Glu Ser Glu Asp Leu  
                   35                  40                  45  
 Tyr Thr Val Ile Ile Pro Lys Gly Lys Arg Thr Ala Ala Pro Ile  
                   50                  55                  60

Leu	Glu	Arg	Lys	Ser	Pro	Thr	Pro	Glu	Pro	Lys	Val	Glu	Asp	Asp	
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Glu	Asp	Leu	Pro	Pro	Thr	Leu	Pro	Pro	Arg	Thr	Phe	Ser	Gly	Glu	
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Gly	Tyr	Asp	Asp	Val	Gly	Val	Ser	Met	Pro	Thr	Val	Ser	Arg	Gly	
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Ile	Tyr	Gln	Pro	Pro	Ile	Val	Gln	Asp	Ser	Asn	Leu	Tyr	Ser	Ser	
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Ile	Gly	Gly	Val	Pro	Gln	Glu	Ala	Gln	Tyr	Asp	Ala	Ala	Ala	Arg	
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Ala	Gly	Gly	Pro	Arg	Lys	Phe	Leu	Tyr	Gly	Pro	Tyr	Thr	Phe	Ser	
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Asn	Gly	Gln	Glu	Ile	Met	Asp	Phe	Glu	Phe	Asp	Thr	Pro	Trp	Pro	
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Asp	Val	Arg	Asn	Ala	Val	Leu	Gly	Asn	Lys	Glu	Ile	Lys	Glu	Glu	
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Trp	Leu	Thr	Thr	Ser	Gly	Pro	Val	Arg	Asp	Ile	Ala	Asp	Arg	Ile	
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Val	Ala	Ser	Lys	Gly	Asp	Leu	Ser	Glu	Asp	Gln	Val	Glu	Glu	Ile	
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Leu	Asp	Ile	Ile	Phe	Met	Asn	Glu	Ser	Glu	Ile	Ala	Glu	Gly	Ile	
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Ser	Asn	Pro	Leu	His	Ala	Asp	Val	Asp	Asn	Asn	Pro	Val	Lys	Gly	
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Ala	Lys	Asn	Val	Met	Thr	Leu	Met	His	Leu	Val	Tyr	Ala	Cys	Asp	
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Val	Asp	Pro	Arg	Ile	Val	Lys	Ala	Leu	Gly	Glu	Val	Glu	Asn	Asp	
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Glu	Gly	Asp	Leu	Gly	Ala	Asn	Ala	Tyr	Asn	Val	Leu	Asp	Ser	Glu	
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Gly	Asn	Leu	Pro	Leu	His	His	Ala	Ala	Lys	Asn	Cys	Thr	Gly	Asp	
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Lys	Leu	Lys	Leu	Cys	Met	Glu	Lys	Thr	Lys	Thr	Asp	Phe	Ile	Asp	
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Thr	Ala	Asn	Phe	Ala	Asn	Gln	Ser	Pro	Leu	His	Ile	Ile	Thr	Gln	
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Lys	Pro	Asp	Cys	Ser	Val	Leu	Asp	Ile	Glu	Glu	Phe	Thr	Ser	Arg	
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Asn	Leu	Asp	Phe	Gly	Leu	Val	Asp	Gly	Asp	Gly	Lys	Asn	Pro	Leu	
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His	His	Ala	Val	Glu	His	Leu	Pro	Pro	Val	Ile	Leu	Lys	Gly	Val	
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Met	Asp	His	Val	Lys	Asn	Ser	Ser	Glu	Phe	Gln	Asp	Leu	Val	Asn	
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Asp	Pro	Asp	Tyr	Phe	Gly	Asn	Thr	Ile	Ala	His	Tyr	Ala	Val	Lys	
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Asn	Lys	Asn	Ala	Asp	Leu	Thr	Leu	Phe	Asn	Met	Leu	Lys	Ala	Ser	
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Gly	Ala	Asp	Leu	Asn	Val	Arg	Asn	Val	Val	Gly	Arg	Ala	Pro	Ile	
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His	Val	Ala	Ser	Ser	Asn	Gly	Lys	Ala	Asn	Ala	Val	Ser	Gly	Leu	
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Val	Ser	Cys	Gly	Ile	Asp	Val	Asn	Ser	Gln	Asp	Val	Asn	Gly	Asp	
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Thr	Pro	Leu	His	Ile	Ala	Val	Glu	Gly	Gly	Ser	Met	Glu	Thr	Val	
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Leu	Ala	Val	Leu	Asn	Gln	Arg	Gly	Ala	Asp	Val	Ser	Val	Gln	Asn	
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Asn	Asp	Gly	Val	Thr	Pro	Met	Leu	Ser	Ala	Ala	Lys	Tyr	Gly	Asp	
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Ile	Gly	Val	Ile	Lys	Ala	Leu	Gly	Ser	Ala	Lys	Pro	Asn	Ile	Lys	
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Gly	Glu	Asp	Thr	Val	Ala	Lys	Ser	Leu	Leu	Met	Glu	Asp	Tyr	Lys	
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Gly	Phe	Thr	Pro	Leu	His	Phe	Val	Ala	Gly	Gly	Gly	Ser	Arg	Asp	
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Thr	Phe	Arg	Val	Val	Arg	Lys	Asn	Tyr	Glu	Lys	Cys	His	Asp	Leu	
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Ala	Thr	Ile	Arg	Ala	Ala	Leu	Met	Gln	Asp	Arg	Ser	Gly	Gly	Glu	
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Phe	Ser	Pro	Ala	Arg	Arg	Gly	Ile	Val	Ser	Ser	Asn	His	Asn	Val	
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Met	Lys	Asp	Ile	Leu	Asn	Phe	Val	Gly	Asp	Ser	Leu	His	Leu	Pro	
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Ser	Glu	Arg	Gly	Tyr	Asn	Ala	Met	Gln	Val	Ala	Ala	Leu	Phe	Gly	
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Asp	Lys	Glu	Ala	Val	Lys	Met	Leu	Ala	Lys	Ser	Ala	Lys	Pro	Ser	
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Asp	Leu	Asn	Phe	Lys	Thr	Ser	Ala	Thr	Pro	Thr	Pro	Leu	Asn	Leu	
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Ala	Cys	Leu	Arg	Gly	Asp	Asn	Glu	Val	Val	Arg	Gly	Leu	Val	Gly	
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Gln	His	Gly	Ile	Asp	Ile	Asn	Gln	Arg	Met	Gly	Ser	Asp	Lys	Asn	
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Thr	Val	Leu	His	Tyr	Ala	Ile	Ser	Lys	Gly	Asp	Ser	Phe	Leu	Val	
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Gln	Lys	Ile	Leu	Ala	His	Thr	Gly	Val	Asp	Val	Asn	Cys	Glu	Asn	
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Asn	Leu	Gly	Gln	Thr	Pro	Leu	His	Leu	Ala	Val	Glu	Gly	Gly	Asp	
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Pro	Lys	Ile	Val	Ser	Ser	Leu	Leu	Lys	Ala	Gly	Ala	Val	Val	Asn	
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Arg	Leu	Asp	Asp	Asn	Gly	Arg	Ser	Val	Leu	Ser	Ser	Ala	Ile	Val	
				785					790					795	
Pro	Gly	Arg	Lys	Glu	Lys	Gly	Val	Leu	Gly	Ile	Val	Asn	Lys	Leu	
				800					805					810	
Leu	Asp	Arg	Gly	Ala	Asp	Ile	Asn	Leu	Asp	Gly	Asp	His	Asn	Ile	
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Leu	Phe	Asp	Gln	Cys	Leu										
				830											